

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-41

**Name:** Silver Lake                      **County:** Hutchinson  
**Legal Description:** T105-R52 Sec. 16-17, 20-21  
**Location from nearest town:** 7 miles north of Freeman, SD

**Dates of present survey:** August 13-14, 2008  
**Dates of last survey:** March 19-20, 1995

Primary Game and Forage Species	Secondary and Other Species
Northern Pike	Black Bullhead
Yellow Perch	White Sucker
Walleye	Common Carp
	Bigmouth Buffalo
	Green Sunfish
	Shortnose Gar
	Channel Catfish

## PHYSICAL DATA

<b>Surface Area:</b> 393 acres	<b>Watershed:</b> 16,701 acres
<b>Maximum depth:</b> 7 feet	<b>Mean depth:</b> 3.5 feet
<b>Volume:</b> 1,375.5 acre-feet	<b>Shoreline Length:</b> 3.85 miles
<b>Contour map available:</b> Yes	<b>Date mapped:</b> 2003
<b>OHWM elevation:</b> 1,435.7	<b>Date set:</b> October, 1985
<b>Outlet elevation:</b> 1,435.3	<b>Date set:</b> October, 1985
<b>Lake elevation observed during the survey:</b> Full	
<b>Beneficial use classifications:</b> (6) warmwater marginal fish life propagation, (7) immersion recreation, (8) limited-contact recreation and (9) fish and wildlife propagation and stock watering.	

### **Ownership of Lake and Adjacent Lakeshore Properties**

Silver Lake got its name from early settlers who thought it resembled a pool of silver. It is listed as meandered public water in the State of South Dakota Listing of Meandered Lakes and the fishery is managed by the South Dakota Department of Game, Fish and Parks (GFP).

### **Fishing Access:**

Silver Lake has shore fishing access and a boat ramp on the east side of the lake and part of the west shore is accessible from the highway rest area. The remainder of the shoreline is privately owned.

## Field Observations of Water Quality and Aquatic Vegetation:

Common cattail (*Typha spp.*), sago pondweed (*Potamogeton pectinatus*), and bulrush (*Scirpus spp.*) were abundant throughout the lake.

## **BIOLOGICAL DATA**

### **Methods:**

Silver Lake was sampled on August 13-14, 2008, with three overnight gill-net sets and 5 overnight trap-net sets. The trap nets are constructed with 19-mm-bar-mesh (3/4 in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. The gill nets are 45.7 m long x 1.8 m deep (150 ft long x 6 ft deep) with one 7.6 m (25 ft) panel each of 13, 19, 25, 32, 38 and 51-mm-bar-mesh (1/2, 3/4, 1, 1 1/4, 1 1/2, and 2 in) monofilament netting.

### **Results and Discussion:**

### **Gill Net Catch**

Black bullheads (72.6%), green sunfish (9.2%) and white sucker (4.7%) were the most abundant fish species sampled in the gill nets this year (Table 1). Six other species were also sampled.

**Table 1.** Total catch from three overnight gill net sets at Silver Lake, Hutchinson County, August 13-14, 2008.

Species	Number	Percent	CPUE <sup>1</sup>	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
<b>Black Bullhead</b>	324	72.6	108.0	<u>+18.2</u>	--	18	0	98
<b>Green Sunfish</b>	41	9.2	13.7	<u>+8.7</u>	--	2	0	113
<b>White Sucker</b>	21	4.7	7.0	<u>+4.1</u>	--	86	81	103
<b>Common Carp</b>	13	2.9	4.3	<u>+4.9</u>	--	8	0	109
<b>O. S. Sunfish</b>	8	1.8	2.7	<u>+1.5</u>	--	--	--	--
<b>Walleye</b>	7	0.2	1.4	<u>+1.0</u>	--	27	0	95
<b>Common Shiner</b>	3	0.7	1.0	<u>+1.3</u>	--	--	--	--
<b>Yellow Perch</b>	2	0.4	0.7	<u>+0.4</u>	--	--	--	--
<b>Northern Pike</b>	1	0.2	0.3	<u>+0.4</u>	--	--	--	--

\*2008 is the first survey year

### **Trap Net Catch**

Black bullheads made up 92.6% of the trap net sample (Table 2). Other species sampled include white sucker, common carp, green sunfish, bigmouth buffalo, walleye, channel catfish, shortnose gar, black crappie, and northern pike.

<sup>1</sup> See Appendix A for definitions of CPUE, PSD, RSD-P, and mean Wr.

**Table 2.** Total catch from five overnight trap net sets at Silver Lake, Hutchinson County, August 13-14, 2008.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
<b>Black Bullhead</b>	2,721	92.6	544.2	<u>+400.1</u>	--	5	0	89
<b>White Sucker</b>	115	3.9	23.0	<u>+8.6</u>	--	88	74	99
<b>Common Carp</b>	38	1.3	7.6	<u>+3.4</u>	--	31	14	104
<b>Green Sunfish</b>	36	1.2	7.2	<u>+4.4</u>	--	11	0	129
<b>Bigmouth Buffalo</b>	12	0.4	2.4	<u>+0.5</u>	--	92	8	68
<b>Walleye</b>	7	0.2	1.4	<u>+1.0</u>	--	--	--	--
<b>Channel Catfish</b>	6	0.2	1.2	<u>+0.7</u>	--	--	--	--
<b>Shortnose Gar</b>	3	0.1	0.6	<u>+0.5</u>	--	--	--	--
<b>Black Crappie</b>	1	0.0	0.2	<u>+0.3</u>	--	--	--	--
<b>Northern Pike</b>	1	0.0	0.2	<u>+0.3</u>	--	--	--	--

\*2008 is the first survey year

## **Walleye**

Silver Lake has been stocked with walleye since 1998 for the primary purpose of producing large fingerling walleyes for restocking in other lakes. The stockings have been mostly unsuccessful due to low water levels and frequent winterkill. However, some over-winter survival has resulted in a walleye population with a PSD of 27, mean length of 363 mm (14.3 in.) and length range of 300-450 mm (11.8 – 17.7 in) (Figure 1).

## **Black Bullhead**

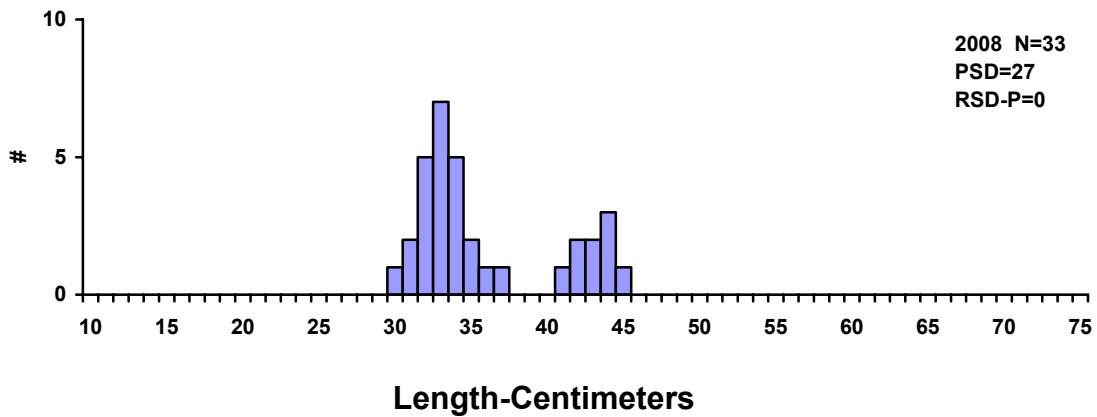
Black bullheads sampled in 2008 ranged in length from 120 to 280 mm (4.7- 11.0 in.) with a mean length of 158 mm (6.2 in) (Figure 2).

## **MANAGEMENT RECOMMENDATIONS**

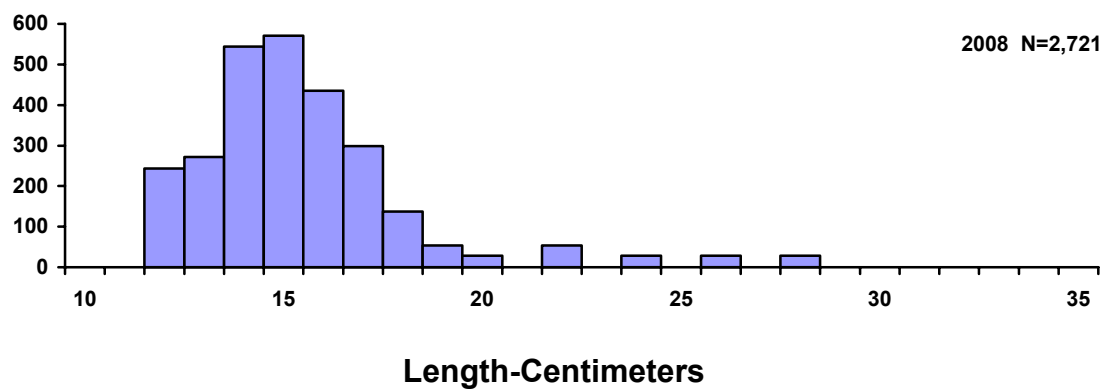
1. Manage Silver Lake as a northern pike, yellow perch and walleye trap and transfer fishery whenever the lake is full enough to reduce the chances of winterkill. The game fish populations will be maintained by stocking but fish will also be transferred to other lakes if needed.
2. Control the bullhead population by stocking predators and by commercial fishing.

**Table 10.** Stocking record for Silver Lake, Hutchinson County, 1995-2008.

Year	Number	Species	Size
1997	1,800	Yellow Perch	Adult
1998	46,000	Walleye	Fingerling
	4,338	Yellow Perch	Adult
1999	43,000	Walleye	Fingerling
2001	431,000	Northern Pike	Fry
2003	108,206	Walleye	Fingerling
2004	58,508	Walleye	Fingerling
2005	86,600	Walleye	Fingerling
2006	215,000	Walleye	Fingerling
2007	2,200,000	Walleye	Fry



**Figure 1.** Length frequency histograms for walleye sampled with gill nets in Silver Lake, Hutchinson County, 2008.



**Figure 2.** Length frequency histograms for black bullheads sampled with trap nets in Silver Lake, Hutchinson County, 2008.

**Appendix A.** A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

**Catch Per Unit Effort (CPUE)** is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

**Proportional Stock Density (PSD)** is calculated by the following formula:

$$\text{PSD} = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

**Relative Stock Density (RSD-P)** is calculated by the following formula:

$$\text{RSD-P} = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters.

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25	38	51	63	76
Sauger	20	30	38	51	63
Yellow perch	13	20	25	30	38
Black crappie	13	20	25	30	38
White crappie	13	20	25	30	38
Bluegill	8	15	20	25	30
Largemouth bass	20	30	38	51	63
Smallmouth bass	18	28	35	43	51
Northern pike	35	53	71	86	112
Channel catfish	28	41	61	71	91
Black bullhead	15	23	30	38	46
Common carp	28	41	53	66	84
Bigmouth buffalo	28	41	53	66	84
Smallmouth buffalo	28	41	53	66	84

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

**Relative weight (Wr)** is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.